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CRITICISMS AND DISCUSSIONS.

ON REALISM.¹

It is of the so-called New Realism that I wish to speak in the present lecture. The neo-realistic movement is one which has arisen among certain American university philosophers within the last twelve or fifteen years and which reached its most adequate expression in a cooperative volume published in 1912, entitled *The New Realism*. It is to be noted that a similar and related English realistic movement developed during the same period but that this movement cannot claim to have reached as high a level of systematic formulation as the American movement. At any rate, the subject of our present discourse is the American realistic school rather than the school of Nunn, Alexander, Moore and Bertrand Russell (in his earlier development). The chief documents for the study of the American realistic school are the collection of papers just mentioned, Perry's *Present Philosophical Tendencies*, Spaulding's *New Rationalism* and Holt's *Concept of Consciousness*. The literature is thus delightfully slight in quantity! (There are, of course, many works of realistically inclined philosophers, which would deserve enumeration in a complete bibliography.)

The chief characteristic of the realistic movement is undoubtedly its negative and destructive character. The realist practises a severe and unrelenting criticism upon all existing systems of philosophy. He tears down the pleasing speculative structure of absolute idealism, with its religious and esthetic values, and he is equally willing to show the flimsy character of pragmatic relativism. It is only natural, therefore, that those who have been accustomed to draw intellectual and emotional satisfaction from either of the two dominant systems regard the realistic polemic with no small degree of apprehension.

The realist approaches the problems of philosophy in a spirit

¹ A Public Lecture delivered at the Rice Institute, April 21, 1920.

of exact reasoning. His ideal is that of exact science. It is precisely at this point that he is opposed by the dominant schools. Both pragmatists and idealists have, under the influence of romanticism, persuaded themselves that exact science is, as they say, abstract, and thus not true of the concrete world. They believe that mathematics and physics are merely games played with abstract concepts which lead us the further from the truth, the longer we play. The real, wherever it may be found, is not (pragmatists and idealists agree) the world of mathematical science. And philosophy itself must not have an exact and rigorous form. It must be speculative, profound, suggestive, rather than precisely true. Now the realist differs from the pragmatist and the idealist in demanding that philosophy be an exact science, or at any rate as exact as possible; that it work in the spirit of mathematical and natural science. And in making this demand for close correlation between science and philosophy, realism is true to one very important tradition in the history of philosophical thought. Side by side with the speculative and theological tendency we have a scientific tendency running through the whole history of philosophy. Plato, Descartes, Leibniz and Kant may be mentioned as having connected philosophy with exact science; Aristotle and Hume as having connected philosophy with biological and psychological science respectively.

Realism means, then, first of all, an examination of existing systems according to canons of rigorous argumentation. In the course of this polemic, however, a certain beginning is made toward reconstruction. The future of realism no doubt consists in carrying on the work of positive and constructive thinking. But for realism it is not of prime importance that a system of philosophy be reached; what is important is that the canons of scientific method be observed. If no system can be reached by these methods, then we must have no system and the business of true philosophy must consist in a perpetual refutation of all false philosophies.

What, then, is the realistic doctrine? First of all, it affirms the theory of epistemological monism. This doctrine is one which is frequently found among philosophers but which is often made the basis for false inferences. Epistemological monism affirms the identity of the perceived or otherwise cogitated object with the real object. The opposite of this is the doctrine of representative perceptionism, which holds that when I perceive a tree there are two things involved, first the tree, and secondly my idea of the tree, and

that my idea of the tree may be like the tree, in which case it is true, or unlike the tree, in which case it is false. This correspondence theory of truth, this assumption of a duality between ideas and things so that the former can copy the latter, realism rejects. And in doing so it is in accord with the weight of philosophical opinion at the present time. The difficulties of epistemological dualism have often been exploited. If my idea of the tree is true when it corresponds to the tree, how can I ever become aware of the truth or falsehood of my idea? For when I attempt to compare my idea of the tree with the tree, it turns out that the latter is itself only known through my idea, and that, consequently, I can only compare my idea with itself and never with the outer object. To compare the idea with the outer object implies some sort of direct contact with the outer object and that is just what representative perceptionism or epistemological dualism denies. The realist assumes the possibility of knowledge, consequently the possibility of distinguishing the true from the false, and he is thus logically forced to deny the dualistic theory, although it must be said that this dualistic theory is almost the only one known to common sense and is embodied in many linguistic forms.

Now this rejection is the point of the first article of Perry's "platform" (1910) : "The object or content of consciousness is any entity in so far as it is responded to by another entity in a specific manner exhibited by the reflex nervous system. Thus physical nature, for example, is, under certain circumstances, directly present in consciousness. In its historical application, this means that the Cartesian dualism and the representative theory are false; and that attempts to overcome these by reducing mind and nature to one another or to some third substance are gratuitous."² We may note that this plank implies Perry's special theory of consciousness, which, however, is not accepted by all the other realists. This theory of consciousness has the merit of extreme simplicity, for it consists in the sharp denial that there is any distinct type of being to be found corresponding to the word consciousness. The notion of consciousness, of an inner mental life, different from, although mysteriously related to, the bodily life, Perry holds to be a superstition.³ What is real about consciousness is simply the fact that beings said to be conscious make certain responses to the environment which others do not. We assume an inner principle to explain

² Cf. *Journal of Philosophy*, etc., 1910, p. 393; *New Realism*, p. 475.

³ Cf. *Present Philosophical Tendencies*, pp. 271ff.

these responses, and we call this principle consciousness, but we know only the manifestations of the principle. It is behavior that is observable and consciousness is merely the assumed metaphysical explanation of behavior; now the elimination of consciousness from our list of real beings is in accordance with the general tendency of modern science to eliminate non-empirical explanatory principles, essences, vital principles, etc., and to keep to the observable facts themselves. I do not wish to express an opinion on the behavioristic theory of consciousness, which has to explain away a good share of introspective experience before it can claim to be established. I merely wish to mention the fact that Perry suggests a definition of consciousness in terms of behavior in the course of stating the doctrine of epistemological monism. The two are not necessarily connected. The object which is the content of consciousness and the "real thing" may be one and the same, numerically identical, whether we define consciousness in terms of mental process or mental activity, according to the traditional notion, or whether we define consciousness in terms of physical response. And it is the former doctrine which is essential in realism.

The second thesis of Perry's "platform" is a denial of Berkeleyan idealism. This denial of subjective idealism is of course what gives realism its name. Now while subjective idealism is, from the point of view of common sense, an extremely paradoxical doctrine, it nevertheless forms the key-note of a great deal of the thinking that falls under the more general heads of idealism and pragmatism. Subjective idealism may be briefly described as the position that the world exists only as the content or idea of consciousness. There is no external world, according to this doctrine, but only souls and their ideas. The regular order which we observe in our ideas, by which one idea tends to be followed by the same idea on each of its occurrences, is produced by the direct will of God working on our finite souls. There is no permanent tree which we can experience or perceive at different times and which different persons can experience or perceive; but God gives our ideas a certain regularity or order which causes us to believe falsely that there is an independent tree. As Schopenhauer said, the world is my idea, and the only difference between the real world and the world of dreams is the greater regularity and system to be found in the so-called real world. Such was the doctrine of the bishop Berkeley, who thought

to have found an invincible argument against materialism and atheism by denying the existence of a material world altogether.

Now subjective idealism, or this paradoxical reduction of the whole cosmos to ideas, is regarded by the realist as the cardinal principle of idealism. Hume was a follower of Berkeley whose radical empiricism led him to even more paradoxical consequences. Hume, in a word, abolished the soul (and tacitly God). He thus reduced the world to a chaotic stream of sense-impressions. And the philosophy of Kant, from which all modern idealism flows, is an answer to Hume. It consequently moves in the same world of thought in which Hume's investigations moved, and has certain deep similarities with Hume's system. For Kant the only world which is open to scientific investigation is what he called the world of possible experience, and not things as they are independently of us, i. e., things in themselves. Now it is clear that this is the system of Berkeley in a new form.

In Kant's system the world of possible experience, the world which constitutes the object of science, does not exist independently of consciousness. If no consciousness existed there would be no space, no time and no permanent mechanism of nature. Consciousness produces these things. In the first place, the sensuous world, colors, odors and sounds, etc., is relative to the sense-organ of the percipient. If there were no eyes, there would be no colors; no ears, no sounds; no noses, no odors. If our organs were different from what they are they would perceive a different world. But this is only the vestibule of Kant's idealism. Not only are the sensible qualities dependent upon the faculties of the perceiver, but the rational or logical form of the world is relative to the understanding of the thinker. It is we who arrange nature in space and time, and who subordinate it to a strict mechanical causality. Our minds read that into nature. Space and time, then, and also the categories of the understanding, causality, substance, necessity, etc., possess for Kant a subjective character. They are relative to the mind that thinks them.

The mind that thinks them, however, is not the private consciousness of the individual. Here we reach the distinctive characteristic of Kant's idealism. Kant begins by assuming the truth of mathematical science, especially as exemplified in the system of Newton, of which he was a great admirer. The truths of mathematics and physics are true for every one, valid for all minds. The

world of mathematics and physics, therefore, is an objective world in precisely this sense, that, namely, it possesses universal validity. Universal validity is in fact for Kant the very meaning of objectivity. Now if the world of mathematics and physics possesses universal validity, if its truths hold for all minds, then it cannot be the mind of the individual to which that world is correlative; it must be what Kant called consciousness in general, *Bewusstsein überhaupt*. Thus Kant is obliged to make use of the notion of a universal mind, to which all the phenomena of the world of space and time are relative. It is this notion of a universal mind which forms the central doctrine of what is called objective idealism. And it is objective idealism which most of the later idealists recognize as the only tenable form of idealism.

Objective idealism, then, or the doctrine that the world is relative to some sort of universal or cosmic intelligence, is an attempt to correct subjective idealism. If subjective idealism were true there could be no world of mathematics and physics with authority over all minds; each one of us could have a private arithmetic, geometry and mechanics. But Kant starts with the assumption of the universal validity of exact science. And he also assumes as part of his starting-point that what is known cannot be independent of the mind that knows it. This assumption is, as the realists have shown, the cardinal principle of idealism proper and is first clearly stated in the doctrine of Berkeley. It is this assumption which the realist makes bold to deny, thus affirming that what is known may be independent of the mind that knows it. It is obvious that in denying the root principle of idealism he has necessarily denied the more complicated and derivative form of idealism which is known as objective idealism. Objective idealism appeals from the individual mind to an assumed universal mind in order to maintain the universality of scientific truths. The realist has no need of the universal reason, for he does not admit that the world known in science depends upon or is in any way affected by the mind that knows it. Now Perry's second thesis is, as I have said, simply the affirmation of what may be called the cardinal principle of realism. "The specific response which determines an entity to be content of consciousness does not directly modify such entities otherwise than to endow them with this status. In other words, consciousness selects from a field of entities which it does not create. In its historical application, this implies the falsity of the Berkeleyan and

post-Berkeleian idealism in so far as this asserts that consciousness is a general *ratio essendi*."

So far we have merely the *assertion* of the realistic position. It is felt that the burden of proof rests on the idealist; hence, the argument for realism consists largely in the refutation of idealism. This is done by showing a number of fallacies which frequently occur in idealistic works. These fallacies the realist isolates and names, thus using the method by which Kant gave the death-blow to speculative theology in the Transcendental Dialectic of the *Critique of Pure Reason*.

The chief fallacies of which the realist convicts the idealist are those of definition by initial predication and of argument from the ego-centric predicament. The procedure of the idealist in the first case is very simple. He declares his intention of looking at the world from the standpoint of experience. This means that he proposes to regard the world primarily as an object of experience, in other words, as an idea, or perception. There is no doubt that the world is in part the object of experience; in other words, many things in the world are perceived or felt or conceived or imagined, in other words, experienced in some way. But for the idealist this aspect of the world, the world as an object of possible experience, the world as idea, is definitive. It is the very essence of the world to be a possible experience. In other words, the relation to consciousness belongs to the essential properties of the world. Now it has long since been observed that the "essence" of a thing depends upon the point of view from which you regard that thing. Thus a table presents a different character depending upon whether it is approached from the standpoint of physics or chemistry or biology, the latter regarding the table as essentially made up of wood from a certain variety of trees. The idealist regards the psychology of the table, the table as a perception, or as an idea, as the ultimate and definitive essence of the table. It is true that the table can very well be regarded as an experience or as a perception, but what the idealist has not proved and cannot prove is that the psychological way of approaching the table has any higher degree of ultimacy or absoluteness than the physical or chemical ways. He defines by initial predication; that is, he first regards the table as a perception and he then arbitrarily considers this one aspect of the table to constitute the true and absolute essence of the table.⁴

⁴ Cf. Perry, *Present Philosophical Tendencies*, p. 126; *New Realism*, pp. 14f.

We may remark in passing that the whole tendency of realism is to deprive psychology of the falsely central position it has assumed. The realist arranges the sciences in a certain order, an order based on the logical dependence of one science upon another. Thus physics depends on mathematics, but mathematics is independent of and anterior to physics. Arranging the sciences according to this principle he gives the first place to the abstract and formal sciences, namely, logic and mathematics, the second place to physics, then comes chemistry, then biology, and lastly psychology as dependent upon all the others. Thus realism is opposed to psychologism, which would give the most complex and derivative science of all the position that belongs to logic and mathematics. But the reign of psychologism in American philosophy, whether as a part of idealism or of pragmatism, is only disputed by the realist.

The second fallacy pointed out by the realist in his attack on idealism is named the fallacy of argument from the ego-centric predicament. This argument is shown to occur in the system of Berkeley and also in other idealistic systems. The idealist draws an unwarranted conclusion from the ego-centric predicament in this way: To establish his conclusion the idealist calls on the realist to show him something which is not perception, experience, idea. The realist, perhaps, refers to the side of the moon which is never turned toward the earth. Here, he says, is something which is not experienced, and is not perception or mental content in any sense. There is no reason to suppose that any actual mind perceives the remote side of the moon. But to this the idealist replies: Ah, but you are thinking of the other side of the moon now yourself. You can't think of it without thinking of it; consequently even the other side of the moon is dependent upon consciousness. Now the ego-centric predicament consists in this undoubted but tautologous fact: that what you think of, you think of. The idealistic fallacy is to infer from this flat tautology that the opposite side of the moon, to revert to our example, exists only in consciousness. It is true that the realist is unable to think of anything which is not thought of by him at that moment, but it by no means follows that there are not many things in existence which are not content of any sort of consciousness.⁵

The realist, then, believes in the independent existence of an external world. But this doctrine is only the beginning of realism.

⁵ Cf. Perry, *Present Philosophical Tendencies*, p. 128; *New Realism*, p. 11.

From a technical point of view the most important realistic theory is probably the external theory of relations. This theory too is negative, being a denial of the theory advocated by certain of the absolute idealists. The controversy between the internal and external theories of relation certainly constitutes one of the most fine-spun discussions in modern philosophy. And yet the point involved is easy to understand. For the external theory of relations is simply an endorsement of the methods of science in the face of anti-scientific criticism.

The internal theory of relations, as we find it in, say, Bradley, amounts to the theory that the world is an organic whole. Everything is related to everything else; nothing is isolated; and these relations are not accidental, fortuitous, to the things related but are essential, internal, to them. A thing's relations belong to its inseparable essence. Such is the doctrine of the idealist. He goes on, however, to say that if nothing is independent of anything else, then nothing can be known until we know everything else. This theory directly contradicts the independent and absolutely autonomous character of mathematics. It implies, moreover, that science follows a false path when it analyzes, abstracts, considers one thing at a time. It breaks up that which is by nature continuous, indivisible, and instead of mastering its object, only falsifies it. The scientist defines, examines his object now under one set of circumstances and now under another, and endeavors to measure the effect of each set of circumstances on his object. If, however, the world is a living organic whole, if everything in the world is inextricably bound up with everything else, then scientific analysis is impossible.

It is against this mysticism, this theory of the impotence of exact science, that Spaulding directs his thoroughgoing *defense of analysis*.⁶ His essay is the third in the realistic treatise. In this essay he examines and, it would seem, refutes all of the current objections to scientific analysis. Not only is the so-called internal theory of relations of Bradley exposed but also the more or less obscurantist positions of Bergson, with their facile appeal to intuition. This discussion is, however, so technical that it would probably not be profitable to enter into it here. We may note, however, that it is the doctrine of the necessity of scientific analysis upon which the realist takes his stand in exposing what he is pleased

⁶ Cf. *New Realism*, pp. 155ff.

to regard as a typical idealistic fallacy. The error of pseudo-simplicity has been one of the chief possessions of the idealists. This fallacy consists in arguing that because a thing is simple before analysis it must be so afterward. It confuses the immediate, first-hand simplicity of an experience, a simplicity which is simply the correlate of our ignorance, with the simplicity of that which is regarded as resisting further analysis on some rational grounds. The realist, in other words, takes a strong stand against immediatism. The immediatist appeals to his "immediate," unreflective experience, his "concrete" experience, and he regards this crude starting-point of knowledge as possessing higher authority than the same experience viewed in the light of scientific analysis and reflection. The realist finds, for example, that consciousness has been given a pseudo-simplicity. We are thought to have an immediate, intuitive, apprehension of our selves, our wills, our intellects, etc. Every attempt to analyze consciousness into simpler elements is met with the charge that consciousness is itself simple, unanalyzable, immediate; that we cannot reduce consciousness to its psychological elements without destroying its peculiar essence. The realist and the experimental psychologist, however, regard this apparent simplicity of consciousness as a pseudo-simplicity. Consciousness *seems* simple only because we have not tried to analyze it.

Another example would be *life*. The vitalist regards life as something ultimate, something which resists all analysis into terms of physics and chemistry. The processes of the living organism are thought to possess a unique and irreducible essence which transcends all varieties of mechanical interaction and chemical combination. The realist would regard life as possessing only pseudo-simplicity. It is simple to unreflective experience, simple in the concrete life of the unscientific. This immediate simplicity is, however, no guarantee that life is ultimately simple. On the contrary, the evidence seems to show that life is a peculiar resultant of certain highly complex mechanical and chemical processes. The realist would not deny the tautology that life is life, but he would insist that life is essentially a complex thing which can only be understood in terms of the simpler processes that go to make it up.

The realist thus takes his stand on the results of scientific analysis and reflection, upon the world as understood, as seen by the intellect, rather than the world as immediately given, that is, as it

is found in crude experience. The preference for the world of unanalyzed experience, for what is vague and unintelligible, however, is very wide-spread among contemporary writers on philosophy. This spirit of anti-intellectualism can no doubt be traced back historically to the influence of Rousseau and romanticism, with their doctrine of a return to nature. The gospel of science, however, is rather that of an advance to nature, nature being precisely what the savage, with his immediate experience, does not understand, being, in fact, not the starting-point but the ideal, and infinitely removed, goal of scientific research.

The opposition between realism and pragmatism, while obvious to the expert, was not on the surface in the early days of the realistic movement. On the contrary, there seems to have been a good deal of sympathy between the two opponents of idealism. In the most recent realistic publication, however, Spaulding's *New Rationalism*, we find one of the most severe and unrelenting critiques of pragmatism which has yet been made. And the cornerstone of this critique is precisely the argument of Plato in the *Theatetus* against the Sophists of ancient Greece. It is in fact the ultimate objection against all forms of relativism and skepticism: that, namely, all the theories which say that man is the measure of all things and that there is no truth, all these theories themselves claim to be the truth and thus contradict themselves. In the extreme form of pragmatism it is maintained, says Spaulding, "that the very 'ideas' or principles of truth, of right and goodness, of correctness, and, indeed, of all tests and criteria, have *evolved*, and that these ideas and principles have persisted, because of their useful and satisfactory character. But the thought of a realm of *facts* that are *independent of being known*, and that, if known, are not influenced by the knowing, *still lurks* in the minds of the *adherents* of this degree of evolutionism, as is shown by the attitude that is still taken toward their own theory. For it is maintained that this, at least, portrays '*things as they are*', and the natural sciences are still drawn upon to furnish many of the details. *And thus the Realism in the position still persists.* Finally a desperate attempt is made to remove this last inconsistency by applying the concept of *evolution* to the very *idea of a real 'world'* and to the *knowledge* of all those details in terms of which, because of the development of language, of beliefs, of conventions, and the like, this '*world*' is *thought of* by human beings. All that we regard the world to be.

either *en masse* or in detail, is here interpreted as man-made. This is pragmatism's *humanism*. If man were a lion, then were God also a lion, said Xenophanes. 'But man is man,' says humanism, and, therefore, is *everything after the image of man*. But whether even this advanced degree of pragmatism's evolutionism is sufficiently consistent is still a question. For, it is still important to ask, whether *man himself* is thus known as *he really is*, or only as a *mere invention*, a growth, a 'working point of view,' an hypothesis? But, if he is this, then it may be asked, Where is the leverage, the resting-point, the *πονηστής* of the system? Must there not be 'somewhere' a reality that is *not* man-made, that is *not* relative, and that is not dependent in any way whatsoever, on being known? *Does not the position presuppose* this, and, also, that this reality is correctly known, even though it be [known] only as a pliable, plastic 'something' that as knowing-processes appear in the evolutionary series, may be modified, altered, and, in short, 'made' *in the form in which it is now known by virtue of its causal relation to the knowing process*? Finally, is this radical evolutionism *itself* man-made and humanistic, and relativistic in the sense that another theory might have become man-made? Or does it present the real state of affairs? To these inquiries the reply must be, that Humanism presupposes a definite *ontology*, and that it accepts this ontology on the basis of a *realistic epistemology*.⁷ Thus "no matter what attitude the pragmatist may will explicitly to express in indignant denial of this, [pragmatism] contradicts itself by explicitly developing the definition of all truth as relative and by then making a tacit exception to this definition as regards the truth of itself as a theory."⁸

The realist is thus interested in showing that pragmatism itself presupposes its opposite. This is in line with Kant's endeavor to get back to the ultimate presuppositions of knowledge, the unyielding logical foundations of thought. The contemporary realist differs from Kant, however, in largely concerning himself with the logical foundations of existing systems of philosophy rather than with the logical foundations of science. Spaulding states in his Preface that the purpose of the *New Rationalism* is to "ascertain both what are those postulates from which each philosophical system is derivable, and also whether there is finally, one body of principles that is common to all systems and logically presupposed by them."⁹

⁷ *Op. cit.*, p. 297.

⁸ *Op. cit.*, p. 301.

⁹ *Op. cit.*, p. vi.

It is his "conviction both that there is such a 'doctrine' difficult though it may be to discover what it is, and also that this doctrine is logically present in every attempt to philosophize rationally."¹⁰ The system of realism thus consists in a set of ultimate logical postulates which are contained, whether implicitly or explicitly, in all attempts to construct a system of philosophy. It may very well be true that no thinker has yet presented, or even can at the present time present, an adequate formulation of these ultimate principles; their nature constitutes on the contrary the essential and unavoidable problem or task of philosophy.

The realist, however, is interested in the presuppositions of other systems of philosophy rather than in the presuppositions of the sciences, and herein consists his essential limitation. No doubt the realists have done much to reestablish that healthy correlation between science and philosophy which is always the sign of sound philosophy, but it is hardly to be denied that they have devoted the greater part of their energies to the technical refutation of other systems of philosophy. This work was necessary and has been well done, but the spirit of realism cannot rest with this result. It must rather advance to the consideration of the foundations of the sciences themselves. And in doing so realism will necessarily establish new relations with all those of the classical philosophers who have already labored on this problem. The problem of the logical foundations of the sciences is really identical with that of what Kant called transcendental logic. Kant's problem, in turn, was not a new one but was rather the perennial problem of the scientific tradition in philosophy. Plato, Aristotle, Descartes, Leibniz, Locke, Berkeley and Hume can all be studied with profit on the question of the logical foundations of science. Realism, in other words, must lay aside its spirit of youthful revolt from the history of philosophy and learn all it can from the great thinkers of the past. And, secondly, realism must press on to more detailed knowledge of the sciences themselves both in their historical development and in their present status. No single mortal can now hope to encompass the whole sphere of science, but a wise division of labor and concentration upon essentials can accomplish much. In this way a definite contribution will be made to the persistent problem of the logic of the sciences.

The system of ideal postulates which will be evolved will more

¹⁰ *Ibid.*

or less adequately explain the history and present status of each of the sciences. It must not be thought, however, that this system of ultimate logical postulates will ever be brought, in the course of human history, to a complete and final formulation. The work of the criticism of science, like that of science itself, is essentially eternal. Each generation of thinkers must formulate anew its theory of science as well as its theory of everything else. And self-evidence can never be an adequate test of what constitutes a true scientific presupposition. What is self-evident to one may not be so to another. The philosopher must in the end rely on his concrete insight into science in its historical character. The presuppositions he seeks will evidence themselves by their efficiency in rendering science intelligible, in showing it as a unified system. A further development of science will therefore always demand a reconsideration of what were supposed to be the ultimate logical foundations of science. Thus the evolution of systems of non-Euclidean geometry was profoundly significant for the philosophy of mathematics, while the recent Einstein-Minkowski theory of relativity in mathematical physics will no doubt involve far-reaching changes in our notion of what physics is.

Realism, then, has practised an effective criticism upon the more or less frankly anti-scientific doctrines of idealism and pragmatism (speculative theology and skeptical relativism) and has itself made some start in understanding the logic of the sciences. Spaulding's critical attitude toward the concepts of substance and causality, the bulwarks of the Aristotelian logic, is, as may be safely said, a decided step in the understanding of the mathematical sciences. Nevertheless, granted that realism is to have a continued development, is not its line of growth in the direction of a more inclusive appreciation of science as it actually exists and of the classical philosophers in so far as the latter have worked on the theory of science?

W. CURTIS SWABEY.

THE RICE INSTITUTE, HOUSTON, TEXAS.